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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,567

05/17/2006

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EXAMINER

VERDIER, CHRISTOPHER M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,567	Applicant(s) NAKAGAWA ET AL.	
	Examiner Christopher Verdier	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 9,10,18,20 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8,11-17,19 and 22-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :5-17-06, 7-24-07, 10-23-07, 2-5-08, 7-1-08, 10-14-09.

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Election/Restrictions

Applicant's election without traverse of species I, figures 1-12 in the reply filed on November 4, 2009 is acknowledged.

Claims 9-10, 18, and 20-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Drawings

Figure 15 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.84(h) because figures 12A-12C are connected by projection lines and contain centerlines, which is objectionable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

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amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities: Appropriate correction is required.

On page 1, line 15, -- of -- should be inserted after “tens”.

On page 1, line 15, “meter” should be changed to -- meters --.

On page 2, line 16, “are” should be changed to -- is --.

On page 3, lines 23-25 are non-idiomatic.

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On page 28, lines 13-19 are non-idiomatic.

Claim Objections

Claim 12 is objected to because of the following informalities: Appropriate correction is required.

In claim 12, line 3, “sued” should be changed to -- used --.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 11, 16-17, 19, and 22-28 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by World Order Publication 2006/033320 (figures 2-7; note US 2007/0297706 is the US equivalent).

Claims 1-6, 19, and 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsujimoto 5,852,947 (figures 9-11). Disclosed is a double-row self-aligning roller bearing, which comprises an inner race 2’/2”, an outer race 1’ and left and right rows of rollers 3’, 3” arranged between the inner race and the outer race, in which left and right bearing portions

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accommodating the left and right roller rows have respective load carrying capacities different from each other. The rollers of the left row have a dimension and a shape (see figure 10) that is different from that of the rollers of the right row. The rollers of the left row have a length different from that of the rollers of the right row. One of the left and right roller rows is comprised of axially hollowed rollers each having an axially extending hollow. The left and right bearing portions have respective contact angles different from each other. The rollers of the left and right rows have respective lengths different from each other and, at the same time, the left and right bearing portions have respective contact angles different from each other. Assuming that the radius of curvature of a ridge of the rollers of one of the roller rows is expressed by $R1$, the radius of curvature of a ridge of the rollers of the other of the roller rows is expressed by $R2$, the radius of curvature of the raceway surface of the inner race, with which the rollers of one of the roller rows contact, is expressed by $N1$, and the radius of curvature of the raceway surface of the inner race, with which the rollers of the other of the roller rows contact, is expressed by $N2$, the following dimensional relationship is established: $N1/R1 < N2/R2$. The radius of curvature $R1$ is greater than the radius of curvature $R2$. The radius of curvature $N1$ is smaller than the radius of curvature $N2$. One of the rows of the rollers having the radius of curvature $R1$ have a length smaller than that of the other of the rows of the rollers having the radius of curvature $R2$.

Claims 1-3, 5-7, 11, 16, 19, and 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Bond 1,736,426. Disclosed is a double-row self-aligning roller bearing, which comprises an inner race 25, 25, an outer race 27, 29, and left and right rows of rollers 26, 30 arranged between the inner race and the outer race, in which left and right bearing portions

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accommodating the left and right roller rows have respective load carrying capacities different from each other. The rollers of the left row have a dimension that is different from that of the rollers of the right row. The rollers of the left row have a length different from that of the rollers of the right row. The left and right bearing portions have respective contact angles different from each other. The rollers of the left and right rows have respective lengths different from each other and, at the same time, the left and right bearing portions have respective contact angles different from each other. The outer race is divided into two axially juxtaposed split outer races. The bearing in its entirety is divided into left and right split bearing portions each comprising a split inner race 25, 25, a split outer race 27, 29 and a single row of rollers 26, 30, in which elements associated with a load or a life are differentiated between the left and right split bearing portions. The dimensions of the inner races, outer races, and rollers are differentiated between the left and right portions. Assuming that the radius of curvature of a ridge of the rollers of one of the roller rows is expressed by $R1$, the radius of curvature of a ridge of the rollers of the other of the roller rows is expressed by $R2$, the radius of curvature of the raceway surface of the inner race, with which the rollers of one of the roller rows contact, is expressed by $N1$, and the radius of curvature of the raceway surface of the inner race, with which the rollers of the other of the roller rows contact, is expressed by $N2$, the following dimensional relationship is established: $N1/R1 < N2/R2$. The radius of curvature $R1$ is greater than the radius of curvature $R2$. The radius of curvature $N1$ is smaller than the radius of curvature $N2$. One of the rows of the rollers having the radius of curvature $R1$ have a length smaller than that of the other of the rows of the rollers having the radius of curvature $R2$.

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Claims 1, 5, 7, 11, 15, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by United Kingdom Patent 2,362,928 (figure 10). Disclosed is a double-row self-aligning roller bearing, which comprises an inner race 11, an outer race 10, 12, and left and right rows of rollers 13 arranged between the inner race and the outer race, in which left and right bearing portions accommodating the left and right roller rows have respective load carrying capacities different from each other. The left and right bearing portions have respective contact angles different from each other. The outer race is divided into two axially juxtaposed split outer races. The bearing in its entirety is divided into left and right split bearing portions each comprising a split inner race 11, 11, a split outer race 10, 12, and a single row of rollers 13, in which elements associated with a load or a life are differentiated between the left and right split bearing portions. The left and right split bearing portions, accommodating the left and right roller rows, are of the same size and the rollers of the left and right roller rows are also of the same size.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over United Kingdom Patent 2,362,928 in view of Japanese Patent 2000-320,550. United Kingdom Patent 2,362,928 (figure 10) discloses a double-row self-aligning roller bearing substantially as claimed, including an unnumbered gap provided between the two split outer races, but does not disclose that a preload is applied to those split outer races.

Japanese Patent 2000-320,550 (figure 1) shows a double row roller bearing having an unnumbered gap provided between two split outer races 1, 1, with a preload applied to those split outer races via a spring 9, for the purpose of preloading the bearing.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the roller bearing of United Kingdom Patent 2,362,928 such that it includes a spring between the outer races, as taught by Japanese Patent 2000-320,550, for the purpose of preloading the bearing.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over United Kingdom Patent 2,362,928 in view of Nakagawa 2005/0148425. United Kingdom Patent

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2,362,928 (figure 10) discloses a double-row self-aligning roller bearing substantially as claimed, but does not disclose that one of the elements associated with the load or the life, which are to be differentiated between the left and right split bearing portions, is a material used to form the rollers (claim 12), and does not disclose that one of the elements associated with the load or the life, which are to be differentiated between the left and right split bearing portions, is a surface reforming treatment to be applied to a rolling surface of the rollers (claim 13).

Nakagawa (figure 1) shows a double-row self-aligning roller bearing having rollers 4A, 4B, and 4C. Rollers 4A and 4C are made of a material having higher durability than roller 4B, with the rollers 4A and 4C made from the surface reforming treatment of carburized steel, for the purpose of providing sufficient load bearing capacity and durability.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the roller bearing of United Kingdom Patent 2,362,928 such that one of the elements associated with the load or the life, which are to be differentiated between the left and right split bearing portions, is a material used to form the rollers, and such that one of the elements associated with the load or the life, which are to be differentiated between the left and right split bearing portions, is a surface reforming treatment to be applied to a rolling surface of the rollers, as taught by Nakagawa, for the purpose of providing sufficient load bearing capacity and durability.

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Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over United Kingdom Patent 2,362,928 in view of Takata 5,145,267. United Kingdom Patent 2,362,928 (figure 10) discloses a double-row self-aligning roller bearing substantially as claimed, but does not disclose that one of the elements associated with the load or the life, which are to be differentiated between the left and right split bearing portions, is a surface roughness of a raceway surface of the split outer race.

Takata (figure 1) shows a double-row roller bearing having an outer race 20, with a roughness at 22a that is greater than the roughness at 22b and 22c, for the purpose of reducing frictional force at the portions with lower roughness.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the roller bearing of United Kingdom Patent 2,362,928 such that one of the elements associated with the load or the life, which are to be differentiated between the left and right split bearing portions, is a surface roughness of a raceway surface of the split outer race, as taught by Takata, for the purpose of reducing frictional force at the portions with lower roughness.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

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application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 3, 7, 8, 19, and 22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 1, 1, 2, 3, 1, and 1, respectively, of copending Application No. 11/663,162. Although the conflicting claims are not identical, they are not patentably distinct from each other because the above claims of copending Application No. 11/663,162 “anticipate” the above claims of the instant application.

Accordingly, the above instant application claims are not patentably distinct from the above copending Application No. 11/663,162 claims. Here, copending Application No. 11/663,162 claims require elements such as spherical rollers, while the instant application claims do not require this feature. Thus it is apparent that the more specific copending Application No. 11/663,162 claims encompass the above instant application claims. Following the rationale in *In re Goodman* cited in the preceding paragraph, where applicant has once been granted a patent containing a claim for the specific or narrower invention, applicant may not then obtain a second patent with a claim for the generic or broader invention without first submitting an appropriate

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terminal disclaimer. Note that since the above instant application claims are anticipated by the above copending Application No. 11/663,162 claims and since anticipation is the epitome of obviousness, then the above instant application claims are obvious over the above copending Application No. 11/663,162 claims.

Claims 23 and 24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable both over claim 1 of copending Application No. 11/663,162. Claim 1 of copending Application No. 11/663,162 claims substantially the same subject matter as claims 23 and 24 of the instant application, but does not claim that the rollers are symmetrical rollers having a maximum diameter positioned at a location intermediate of the length of the rollers (claim 23), and does not claim that the rollers are asymmetrical rollers having a maximum diameter positioned at a location displaced from a point intermediate of the length of the rollers (claim 24).

Official Notice is taken that roller bearings have symmetrical rollers having a maximum diameter positioned at a location intermediate of the length of the rollers, and have asymmetrical rollers having a maximum diameter positioned at a location displaced from a point intermediate of the length of the rollers, for the purpose of controlling the loading of the roller bearing.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the roller bearing of claim 1 of copending Application No. 11/663,162 such that the rollers are symmetrical rollers having a maximum diameter positioned

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at a location intermediate of the length of the rollers, and such that the rollers are asymmetrical rollers having a maximum diameter positioned at a location displaced from a point intermediate of the length of the rollers, for the purpose of controlling the loading of the roller bearing.

Claims 25, 26, 27, and 28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable all over claim 1 of copending Application No. 11/663,162 in view of claims 7, 8, 9, and 10 of copending Application No. 11/663,162. Claim 1 of copending Application No. 11/663,162 claims substantially the same subject matter as claims 25-28 of the instant application, but does not claim that the radius of curvature of a ridge of the rollers of one of the roller rows is expressed by $R1$, the radius of curvature of a ridge of the rollers of the other of the roller rows is expressed by $R2$, the radius of curvature of the raceway surface of the inner race, with which the rollers of one of the roller rows contact, is expressed by $N1$, and the radius of curvature of the raceway surface of the inner race, with which the rollers of the other of the roller rows contact, is expressed by $N2$, with the following dimensional relationship established: $N1/R1 < N2/R2$ (claim 25), does not claim that the radius of curvature $R1$ is greater than the radius of curvature $R2$ (claim 26), does not claim that the radius of curvature $N1$ is smaller than the radius of curvature $N2$ (claim 27), and does not claim that one of the rows of the rollers having the radius of curvature $R1$ have a length smaller than that of the other of the rows of the rollers having the radius of curvature $R2$ (claim 28).

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Claims 7, 8, 9, and 10 of copending Application No. 11/663,162 show a roller bearing having the radius of curvature of a ridge of the rollers of one of the roller rows expressed by R_1 , the radius of curvature of a ridge of the rollers of the other of the roller rows expressed by R_2 , the radius of curvature of the raceway surface of the inner race, with which the rollers of one of the roller rows contact, expressed by N_1 , and the radius of curvature of the raceway surface of the inner race, with which the rollers of the other of the roller rows contact, expressed by N_2 , with the following dimensional relationship established: $N_1/R_1 < N_2/R_2$, the radius of curvature R_1 being greater than the radius of curvature R_2 , the radius of curvature N_1 being smaller than the radius of curvature N_2 , and one of the rows of the rollers having the radius of curvature R_1 having a length smaller than that of the other of the rows of the rollers having the radius of curvature R_2 , for the purpose of controlling bearing loading.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the roller bearing of claim 1 of copending Application No. 11/663,162 such that the radius of curvature of a ridge of the rollers of one of the roller rows is expressed by R_1 , the radius of curvature of a ridge of the rollers of the other of the roller rows is expressed by R_2 , the radius of curvature of the raceway surface of the inner race, with which the rollers of one of the roller rows contact, is expressed by N_1 , and the radius of curvature of the raceway surface of the inner race, with which the rollers of the other of the roller rows contact, is expressed by N_2 , with the following dimensional relationship established: $N_1/R_1 < N_2/R_2$, such that the radius of curvature R_1 is greater than the radius of curvature R_2 , such that the radius of curvature N_1 is smaller than the radius of curvature N_2 , and such that one of the rows of the

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rollers having the radius of curvature R1 have a length smaller than that of the other of the rows of the rollers having the radius of curvature R2, as taught by claims 7-10 of copending Application No. 11/663,162, for the purpose of controlling bearing loading.

These are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Verdier/
Primary Examiner, Art Unit 3745

Christopher Verdier
Primary Examiner
Art Unit 3745